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# Aristotle on Meaning and Natural Kinds

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# ARISTOTLE ON MEANING AND NATURAL KINDS

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1. One of the attractions of the study of the history of the philosophy is the opportunity it offers to consider attempted solutions to major and persistent philosophical puzzles which differ from those that are current today. The discernment of these differences has its own scholarly value. But its interest for philosophers who study Aristotle as a philosopher is increased when we find in his writings important and plausible proposals distinct from those that now engage the philosophical imagination. The aim of this paper is to suggest that this is true of Aristotle's account of the meaning of terms like 'thunder', 'eclipse' or 'man',[1] and of their connections with the correct scientific account of the phenomena they signify. Thus, I will argue that Aristotle's view of the meaning of these terms differs, in two important respects, from that proposed in the influential Putnam/Kripke[2] account of these issues: ith respect, that is, to what I shall call the 'semantic depth' and 'existential implication' of such terms. My primary focus will be on certain crucial chapters in Posterior Analytics II (esp. 7-10); but I will seek to relate the views of these chapters to wider issues concerning how the meaning of such terms is fixed.

2. According to the modern essentialist,[3] certain terms in natural language have their meaning fixed in such a way as to correlate them with kinds whose essence is still to be discovered. These terms cut the world 'at its joints' in such a way as to make distinctions between kinds in nature which turn out to be the ones which science studies and explains. This correlation is explained because in giving the meaning of eg 'water' we intend to count a liquid as water as follows:

> for every possible world w, and every individual x in w, x is water in w iff x in w is liquid with the same fundamental physical constitution (whatever that may be) as this liquid in the actual world.

Thus, in giving the meaning of 'water', we assume

(A) that water has some (unspecified) fundamental physical constitution, and that if something is to be water in any possible world it must possess this constitution (SEMANTIC DEPTH), and

(B) that water exists (EXISTENCE ASSUMPTION): ie that water is instantiated in this world. If there is no such liquid as water, the sense of 'water' cannot be given in this way by means of a demonstrative picking

out an actual sample of water in this world. It is because the pre-scientific thinker makes these two assumptions in learning the meaning of 'water' that he is prepared to defer to the scientist who comes to grasp the relevant fundamental properties of the liquid they both encounter.

The semantic depth of the meaning of 'water' is important for other parts of the modern essentialist's programme. In particular, it allows him to explain how it is possible for (eg) water to have its fundamental properties essentially (in all possible worlds in which it exists). For given our referential intentions in introducing the term 'water', we would refuse to count something as water if it lacked the fundamental physical constitution that this liquid possesses. Thus, nothing more is required to generate the possibility of essentialist claims apart from the physical necessity of water's possessing a given fundamental explanatory property and our original referential intentions in using the term 'water'. In this way, the modern essentialist aims to render coherent essentialist claims without taking anything other than fundamental explanatory properties to be part of the fabric of reality. The rest is left to us and our pre-scientific referential intentions.[4]

One might reasonably question whether our pre-scientific referential intentions are as determinate as the modern essentialist supposes.[5] For present purposes, however, it is sufficient to note two major demarcations within accounts of the meaning of terms such as 'water':

[A] Accounts which are semantically deep / are to be contrasted with those that are semantically shallow. I count an account as semantically deep if it assumes

(i) that (eg.) water has a fundamental physical constitution

and

(ii) that water has that constitution in all possible worlds in which it exists.

I will call an account semantically shallow if it makes neither of these assumptions. (There are two types of accounts that are of intermediate depth and accept either (i) or (ii), but not both).

[B] Accounts of the meaning which involve existence assumptions / are to be contrasted with those which do not. The latter are parts of a three-stage view of scientific discovery:

(i) discovery of meaning of (eg) 'water';
(ii) discovery that water is instantiated;
(iii) discovering what the essence of water is.

In the former, there are just two stages, as (i) and (ii) are collapsed into one stage.[6] Within a two-stage account, if there is no water, the sense of 'water' cannot be given in the favoured 'natural kind' way indicated above.

I wish in sections 3 - 5 to present some arguments for the view that Aristotle's account of the meaning of such terms in the Posterior Analytics is semantically shallow and not existence-committing. Here, I will give one reading of a series of controversial passages. While I do not doubt

that other readings of these passages are possible, I will seek to defend mine by anchoring it in a more general view of the relevant parts of Aristotle's theory. (Section 6 )

3. The opening lines of B 10 appear to favour a 3-stage view in which the first stage is semantically shallow. They run as follows (93b29-94a2):

> Since a definition is said to be an account given in reply to the "What is _____?" question, it is clear that one kind of definition will be an account given in reply to the question "What is it that a name or name-like expression signifies?" [7] An example of such a question is "What is it that 'triangle' signifies?" When we grasp that what (it is that) is signified exists, we seek the answer to the "Why?" question. It is difficult to understand in this way (viz through gaining an answer to the "Why?" question) things which we do not know to exist. We have stated the source of this difficulty above: viz that we do not know whether or not the thing exists, except in an incidental way. An account (defining account)may be one in two ways: either by being stitched together, like the Iliad, or because it shows one thing belonging to one thing non-incidentally. The above is one definition of definition, but another definition in an account which shows the answer to the "Why?" question. In this way the first type of definition gives the meaning but does not prove, whereas the latter type will clearly be like a demonstration of what a thing is, differing from a demonstration in the arrangement of terms."

In the first three sentences, Aristotle appears to commit himself to a three-stage view. (93a29-32). The passage seems to separate 3 stages as follows:

(a) Stage 1: this stage is achieved when one grasps a defining account of what a name or name-like expression signifies;

(b) Stage 2: this stage is achieved when one grasps that what is signified by a name or name-like expression exists;

(c) Stage 3: this stage is achieved when one grasps the essence of the object/kind signified by a name or name-like expression.

If Aristotle does indeed commit himself to a 3-stage view of this type in his passage, two consequences immediately follow:

(a) it is not required in grasping an account of what a name or name-like expression (eg) for a kind signifies that one grasps that the kind is instantiated;

(b) it is not required in grasping an account of what a name or name-like expression (eg) for a kind signifies that one grasps anything of the internal structure possessed by members of the kind. For that understanding will be supplied by an answer to the "Why?"

question at stage three. At the initial stage the ordinary thinker may have no view as to the connexion of his usage and scientific definition.

If Aristotle is committed to (a) and (b), he will not hold that

(i) grasping an account of what a name or name-like expression signifies involves grasping the existence of things denoted by the name whose significance is thus accounted for;[8]

(ii) grasping an account of what a name-like expression signifies involves reference to the essence of (eg) water.

In particular, he will not hold (in general) that

"names signify essences"[9]

or that

"Many competent speakers do not know the essence of sharks... but they signify these essences by their use of their words nonetheless".[9]

My immediate aim is to defend this interpretation of 93b29-94a2 by arguing that Aristotle accepted both (a) and (b).

A. Existential Issues

I want to give two argument from the Posterior Analytics that favour the claim that accounts of what names signify are not existence-involving.

(a) In 71a11-17, Aristotle writes:

"It is necessary to be already aware of things in two ways. In some cases, it is necessary to grasp in advance that they exist, of some it is necessary to grasp in advance what the thing said is, and of others both: eg. of the fact that everything is affirmed or denied truly, one must believe that this is so; of the triangle, one must believe that it signifies this, and of the unit both what it signifies and that it is. For each of these is not equally clear to us."

In this passage, Aristotle distinguishes two kinds of proposition which he thinks can be known without proof, and which are the starting point for proof:

(1) what the term means;

(2) that certain things exist or that certain things are so.

He then distinguishes (1) from (2a): statements that things exist: 72a19: hypothesis:
(2b) statements that certain things are thus and so: 72a17: axiom,

and elsewhere treats (1) as a thesis, not a hypothesis. (72a19ff). Thus, he distinguishes what is essentially involved in grasping the meaning of 'triangle' from what is involved in grasping that it or the monad exists. For he says that in this case the grasp of the meaning of 'triangle' does not involve grasping that there are triangles; for if it did, he wouldn't have distinguished this case from one in which one grasped the existence in advance.[10] But if so, grasping the meaning of the term cannot involve existence-assumptions in this case. Nor can it in the case of the monad either: for then one would not need both to assume its meaning and its existence, since in grasping its meaning one would also have grasped that it exists. Since Aristotle is concerned to distinguish these two graspings here and elsewhere, the initial grasp of meaning will not involve the assumption of existence.[11]

(b) In the early chapters of Posterior Analytics B, Aristotle is concerned with cases in which we enquire whether or not

(i) a centaur or a god is or is not: 89b32-3

(ii) the moon is or is not: 90a5, 90a12

(iii) the triangle is or is not: 90a 13

(iv) the sun/moon/earth is or is not: 90a 12-13.[12]

In these contexts Aristotle's concern with enquiry as to existence strongly suggests that there is no assumption of existence built into the terms involved. For he considers cases in which one knows enough about (eg) eclipses to discover if they exist, but does not yet know whether they exist. It would be irrational to build into the account of what 'F' signifies an assumption of existence at the beginning of an enquiry as to whether it exists or not. For this is precisely what the enquiry aims to test. The rational assumption would rather be encapsulated in a phrase of the following type:

(i) god, if he (she) exists, is an omniscent agent;

(ii) triangles, if they exist, are three-sided figures;

for these would remain neutral as to the question of their existence. Since, in these chapters, Aristotle represents these terms as having meaning against the background (the context) of an enquiry as to whether the object they signify exist, it is implausible that he should have taken the assumption that they do exist as part of the meaning of the initial term. For this is what needs to be established through the enquiry. Why should anyone assume at the outset one answer (viz that F's exist), when it is precisely this that one is concerned to investigate?

Elsewhere, Aristotle himself accounts for what it is that names signify in the rational (ie. non-existence) involving way. Thus, for example, in discussing what it is that 'void' signifies, he writes:

'The void is a place, if there is one, which is deprived of body' (Physics 214a16-17), in which the qualifying phrase ('if there is one') renders the sense of 'void' non-existence assuming. And this is precisely what is to be expected since Aristotle is attempting, on the basis of this account, to work out if the void exists (214a17-20). Hence, it would have been for him irrational to construe its initial significance as existence-involving.[13]

It might be objected that while at the initial stages of enquiry there is no existence-assumption in the account of what the name signifies, this is introduced subsequently when the kind in question is found to exist. There seems, however, no reason to attribute to Aristotle the (anyway apparently implausible) claim that the sense of 'triangle' or 'eclipse' changes when they are found to be instantiated. For he treats terms such as 'eclipse' in the same way in contexts such as:

> Do exclipses exist?
>
> What is their internal structure, granted that they do exist?[14]

I can find no evidence in favour of attributing to Aristotle the view that the sense of 'eclipse' changes between these two questions. Since this would have been a claim he would have needed to make (and to defend) if he had accepted the two-stage (existence-involving) account of the meaning of these terms, its absence (together with his non-existence-committing treatment of 'void') weighs heavily against attributing to him a two-stage view. Once one sees his account of the signification of names for kinds in its proper context as an ingredient in an enquiry into existence and essence, it becomes implausible to represent the assumption of existence as a constituent of the initial grasp of the relevant terms.[15]

## 5. Semantical Depth

The view of an account of what a name signifies given in the previous section points to the lack of semantic depth of the account also. For Aristotle, the assumption that the kind has an internal structure will enter with grasping that (eg) thunder exists, at least in those cases where the middle term is different from the thing to be explained (90a7-8, 93a5-6, 7-8).[16] In examples where there is a middle term, in grasping that it exists we will grasp that it has a middle term - though not necessarily what it is. Thus, considerations of semantic depth enter with grasp of existence rather than grasp of meaning (at stage (2) other than stage (1) ). I want to give two arguments for this view based on an interpretation of Posterior Analytics B.8.

### (a) The Argument of 93a20-36.

I will present an extract from this passage as follows:

"As to the question of whether something exists, sometimes we grasp this incidentally, and sometimes through grasping something of the thing itself - eg in the case of thunder, that it is a certain noise in the clouds, and in that of an eclipse, that it is a certain deprivation of light, and of man, that he is a certain animal, and of the soul, that it is something that is a self-mover...[17] In the case in which we possess something of the what-it-is, we proceed as follows.[18] Eclipse A, moon C, screening by earth B. So to ask whether it (viz the moon) is eclipsed or not is to seek whether B is or not. And this is no different from seeking whether there is an account of it...When we discover the account, we know at the same time the fact (that it is) and the answer to the 'Why?' question - if the account is given by means of immediates."

In this passage, when we have something of 'the what-it-is', we are able to proceed to establish non-incidentally that F's exist (a33). In this case we possess something of the matter, but do not know the relevant middle term. Since the middle term (eg. fire extinguishing) introduces talk of essence or casual antecedents, when we possess 'something of the matter' we do not as yet grasp anything of the essence. Essential features enter only with the establishing of existence by means of the discovery of a middle term. At the initial stage there need be no assumption at all concerning whether or not the kind has an essence. That enters only at the next stage in determining its existence.

This claim can be supported by considering Aristotle's examples in the present context of 'grasping something of the matter':

(i) thunder: a certain type of noise in the clouds;

(ii) eclipse: a certain type of deprivation of light;

(iii) man: a certain type of animal

(iv) soul: the one thing that moves itself;

for these do not contain any reference (explicit or implicit) to internal structure or causal antecedents. This is clear in (iii), where the use of 'a certain' modifies animal to give a certain type of animal, and does not modify A which is C in the way which might point to a concealed middle term. Further, in (iv), there is no possibility of a supposed reference to a concealed middle term. If so, it is implausible to suppose that the uses of 'a certain' in (i) or (ii) perform the quite different task of indicating the presence of a concealed middle term (i.e. the type of noise caused in a given way), as would be required if Aristotle had regarded these accounts as semantically deep. Further, if he had intended the uses of 'a certain' in (i) or (ii) to play this role, this should have been indicated explicitly in the context or in the syllogisms given in the latter part of the chapter (93a30-b14).[19] Thus, it seems that in the cases specified, there is ground for not detecting a concealed reference to the internal structure of (e.g.) thunder at the initial stage. All that there is is reference to a certain

type of noise in the clouds (if it exists) classified without the assumption that the type is one which forms a proto-scientific kind. The relevant types can be determined by the practical purposes of the ordinary reasoner without any commitment to a proto-scientific theory (see below).

(b) 93a4-17, a30-b14: Conclusions and Syllogisms

At the beginning of B 5, Aristotle contrasts this chapter with B 4 as follows. (93a4-17). In B 8, Aristotle envisages syllogisms of the following form:

[1] Being noise (C) belongs to (φ) all fire-extinguishings (B)

All fire extinguishings (B) belong to (φ) clouds of kind K (A)

Being noise (C) belongs to (φ) all clouds of kind K

In B4, by contrast, he considers syllogisms of the form

[2] Fire extinguishing (B) φ clouds of kind K (A)

Fire extinguishing (C) φ clouds of kind K (A)

in which the conclusion specifies in the C term the essence of eg. (what it is to be) thunder. About these syllogisms, Aristotle makes the following (good) point:

"If the conclusion in [2] states what the essence of thunder is, then the premisses must also indicate essential and not just unique features of thunder. But if so, the essence of thunder would be given in one of the premisses as well as the conclusion. So one will not deduce what is essential to thunder without already assuming this in the premisses."[20]

Given this criticism of the attempt to demonstrate what F is as the conclusion of a syllogism (in B 4), Aristotle needed to distinguish between propositions which had the same truth conditions as conclusions of syllogisms, and those which did not but referred also to the underlying essence of the kind; for it is the former which are demonstrated in B 8, while the latter are not. So he was forced to the distinction which in B 10 he draws as follows:

> 94a5-9: "What is thunder?" It is the noise of fire being quenched in the clouds. So the same account is given in different ways: in one way, it is a continuous demonstration, but in this way it is a definition. Again, a definition of thunder is noise in the clouds; and this is the conclusion of the demonstration of what it is."

The former, with its reference to the essence is not demonstrated, but the latter is. If the truth-conditions of the latter cannot contain reference to the internal cause, then semantically they must be shallow. Hence, if it is correct to see some accounts of what a term signifies as expressing

the same proposition as the conclusion of the syllogism, they too must be semantically shallow.[21] If so, Aristotle cannot have built into the account of what names such as 'thunder' signify any reference to the internal (let alone physical-chemical) structure of thunder. For if he had, the account could not play the role required of it. Hence, it cannot be part of our intention in using these terms to defer to experts about the internal structure of the phenomenon: for if it had been this would have been part of the sense of the terms. Thus it seems that Aristotle was strongly motivated by his view of the role accounts of what names signify play to treat them as semantically shallow.

The two arguments of this section cohere. The point of possessing an account of what a name signifies is that it provides one necessary condition for establishing (non-incidentally) that (eg) the kind exists. To establish that it does in fact exist (in the cases under discussion) involves finding a middle term which allows one to demonstrate that (eg) noise belongs to in the clouds (and so that thunder exists).[22] If the original account is to play this role it cannot be existence-involving; for that would be to assume at the outset that there is a middle term. Nor can it be essence-invoking; for if it were, this would involve features which could not be proved (in the approved B 8 style) from an essence-involving middle term. For these reasons, the original account of what a term means is, in these chapters, neither existence-assuming nor essence invoking.

6. The Meaning of Names and Name-like expressions: Accounts of what names and name-like expressions signify.

In the previous sections, I have taken the phrase 'an account of what names...signify' as a primitive to be explained by its role in Aristotle's account of inquiry. The phrase is ambiguous: it could mean:

(a) an account of the signification of 'F', which could be given by an axiom which gives sense of 'F';

or

(b) an account of the thing (if there is one) which 'F' signifies;

or

(c) a mixture of (a) and (b);

In this section, I aim to disambiguate the sense of this phrase by sketching an account of how the meaning of a name is determined in Aristotle's theory. In this way, one will find further support for the shallow and non-existence committing accounts of what the words signify given in the previous sections. (I should emphasize that what follows is a sketch of an account only).

(a) Aristotle on the Meaning of Names (1)

My suggestion is this. Aristotle's account of the meaning of names is one in which the sense of (eg) 'thunder' is determined by our being connected

with the phenomenon (thunder) in the world, if there is one, by a non-conventional (partially causal) relation. This does not require that the person who understands 'thunder' holds correct beliefs about thunder or is able to determine the extension of 'thunder'. In this way, Aristotle's theory is an austere one, and is quite distinct from Fregean and most post-Fregean accounts of sense.

At the outset of de Interpret., Aristotle writes:

> "Spoken sounds are symbols of affections in the soul, and written sounds are symbols of spoken sounds. And just as written marks are not the same for all, neither are spoken sounds. But what these are in the first place signs of - affections of the soul - are the same for all; and what these affections are likenesses of - things in the world - are the same for all." (16a3-8)

In this paragraph, Aristotle implicitly accepts the claim of the Cratylos (338B-C) that names are used to divide the world at its joints, while explaining how this is consistent with names being (in some way) conventional. It is the affections of the souls which are sensitive to real differences between things. Spoken sounds have a conventional relation to these affections (16a26-28) which is characterized by the term 'being a symbol of'; but the affections stand in a non-conventional relation (homoiomata) to things in the world. The conventional (symbolical) relation between sounds and psychological states is not semantically insignificant (they are signs: 16a6). However, the basic semantic connection (I wish to suggest) is that between sounds and things in the world mediated by affections of the soul which are 'like' things in the world. If this is correct, names have their significance in virtue of being correlated with things in the world via affections of the soul. That is,

> the meaning of term 't' (of this kind) is determined by being being correlated with an object in the world (o) by means of
>
> (i) a conventional connexion between the expression 't' and a psychological state (s);
>
> (ii) a non-conventional connection between that psychological state (s) and o.

Thus, to give an account of what 'gold' means would be to state which kind in the world it is with which 'gold' is correlated in these ways. In this account, the content of the relevant psychological state (s) is determined by the thinker's being related to instances of gold in the appropriate non-conventional relation.

Aristotle refers us to the psychological treatises for a further account of (ii): de Interp. 16a8-9. And his account there of thought and perception offers the basis for the austere theory of meaning sketched above. Aristotle's treatment of thought and perception is guided by two dominant themes:

[I] In both, the relevant psychological state is one in which one is affected by the relevant object in a given way; in this, one receives the 'form' from the object in some way (without the matter):(the assimilation model).

[II] In both, the relevant psychological state is one in which one becomes identical in actuality with the object of that state.

Aristotle's account of [I] in de Anima (esp. 416b35-417a2, a18-20, 418a 3-6) refers to his general account of affecting and being affected given in de Gen. Corrup. I.7. In this account, the agent makes the patient like itself (homoioûn), with the effect that the patient is made like ( homoiômata) the agent (418a3-6). Thus, Aristotle writes:

> 324a9-11. "This is why it is indeed plausible to say that fire heats and the cold cools, and that to speak generally what is active (viz the agent) makes the patient like itself" (homoioûn).

Transferred to the case of perception the model runs like this. What is seen (eg gold, Caesar) induces in the perceiver (patient) a state which is determined in its relevant respects by the agent (gold, Caesar) and its relevant properties. The state of the perceiver is caused to exist and determined in its relevant features by the object of perception, as the quality of a wax-imprint is determined by the shape of the bronze which forms it (424a19ff). The content of the relevant psychological state is determined by the object of perception (ie gold, Caesar) in the world which causes it. It is the input conditions which cause and functionally determine the content of the perceptual state.

This account of [I] is supported by [II]: the identity in actuality thesis. Of this, Aristotle writes:

> "The sensitive and the cognitive faculties of the soul are potentially these objects viz the sensible and the knowable. These faculties, then, must be identical either with the objects themselves or with the forms set up by those objects. Now they are not identical with the objects; for the stone does not exist in the soul, but only the form of the stone. (431b27-432a1).

In actuality the operation of the perceptual faculty (viz perception) and its content is constituted by the presence of the form set up by the imprint in the perceiver. That is, the content of perception is fixed by the input to the organizsm in such a way that one cannot state what is perceived without reference to the object (if there is one) which causes the perception. Which object is perceived (viz the content of the perception) is fixed by which object (in the world) is the appropriate cause of the internal state. The identity of the object of perception is constituted by the input conditions (in the favoured case) including essentially the object which causes the perception. The point of the second theme (II) in Aristotle's account of perception is to show how the input conditions emphasized in (I) fix

the object of the perceptual state which they cause.

Let us transfer this account back to the case of the sense of a name. 'Cicero' will have its significance (in the simplest case) by its being correlated with a thing in the world via a perceptual state whose content is determined by its input conditions (involving Cicero). Similarly, 'water' will have its significance by being correlated in these ways with a kind in the world to which the affection of the soul corresponds. This significance is quite independent of any beliefs pre-scientific thinkers may have about the desirability of correcting their usage in the light of scientific advance or expert testimony about the internal structure of water in this or any other possible world. The term 'water' will have a sense of minimal semantical depth. Thus, to be a natural kind term will not involve being grasped at the outset in a distinctive way by the pre-scientific thinker; it will involve only being grasped by one whose thought stands in the 'likeness' relation to the kind in the world. Nothing more than this is required of his initial grasp of the term. The way the world is determines what concepts we have by determining which thoughts we have.

(b) Semantic Shallowness and Accounts of what it is that names signify.

If this account of the meaning of names is correct, it will not be required that to understand a name one needs to know truths about the object named. If so, the role of 'an account of what a name signifies' cannot be to give the meaning of the name. Rather it should offer an account of what it is that the name signifies which need not be known by the person who understands the name. Thus, for the axiom

'gold' means gold

the relevant account will determine what gold is (ie fill out the right hand side of the schema), without requiring that this is known by the person who understands 'gold'. Rather the account itself can call on information about gold which is not available to the ordinary thinker who uses and understands 'gold'. The major point of this account, then, will be to assist in discovering whether gold exists (as suggested in the previous section), and not to give the significance of gold.

The first consequence of this account concerns Aristotle's view of the meaning of names. If the account given is correct, it is clear that Aristotle's view is very different from but given in the main-stream of contemporary (c 20th) theorising. For in that account,

(a) our practices in using terms such as 'gold' determine the sense of 'gold': eg. our patterns of deference to experts determine that in introducing the term 'gold' we intended our usage to be sensitive to discoveries about this substance;

(b) sense determines extension/reference: ie. the sense of 'gold' thus proposed determines in (at least) this world which substances are gold.

However, if the sketch of de Interpretatione is correct, Aristotle did not accept this pattern of explanatory direction: viz practices → sense → reference. In his view, the sense of a term is explained by its reference

ie. which kinds there are in the world determine what concepts we have, because they determine what 'affections' there are in our souls. Because practices and sense do not determine extension in Aristotle's theory, the relevant terms will lack the semantic depth insisted on by the modern essentialist to ensure that the extension is correctly fixed. In Aristotle's account, 'gold' (as used by a speaker) means gold even if he is not able himself to fix the extension of gold and is not appropriately equipped with the deference mechanism, provided that he stands in the favoured naturalistic/conventional relations to the kind in the world.[24]

The second consequence of this account concerns the role of 'the account of what a name or name-like expression signifies'. In the schema,

't' means o ,

an account of what the name signifies is required over and above what is involved in understanding 't', so as to enable the speaker to grasp (non-incidentally) that (eg) gold exists. In sharp contrast to Fregean accounts, what determines what o is will not be involved in understanding 't', but will be features drawn from the theory of definition which need not be at the disposal of the ordinary user of the name. Thus, Aristotle's accounts of what it is that 'void' signifies call on philosophical theories which need not be accessible to the ordinary thinker. (214a4-15)[25]

This account of what a name signifies may be represented as follows:

> 'thunder' means thunder, and thunder is a certain type of noise in the clouds
>
> or
>
> 'gold' means gold, and gold is a certain type of ductile metal [26]

To discover that thunder exists, one needs the resources to answer the question:

'Is that noise thunder or a sound like that of thunder (but not thunder)?'

Aristotle's solution to this is to suggest that one needs to grasp (in this case) something of the causal antecedents of thunder (over and above the account of what the name signifies) to ensure the basis for a correct answer. In the favoured case (Post. An. 93a30-6), one may immediately grasp the essential middle term; but in others one will 'latch on' to enough of the causal ancestry to establish that this is thunder without grasping the essence-invoking middle term (93a36-b14). In this way, it is only when one comes to establish the existence of thunder (rather than a sound-alike) that considerations of its internal structure are relevant?[27] And these will not be relevant to the initial grasp of the meaning of the term.[28] Once grasp of meaning and determination of extension are separated, there is no need to attribute to one who merely grasps the meaning of 'thunder' the resources required to answer the question 'Is this thunder?' in such a way

as to have non-incidental knowledge that thunder exists. One may understand the meaning of this term and not yet be equipped to know non-incidentally that what it signifies exists.

(c) Names, Accounts of what names signify and Non-Existents

The shallow account of the meaning of names matches the shallow account of what names signify. But is the account of how their meaning is fixed consistent with the non-existentially committing account of what it is that they mean given in section 4? If the meaning of (eg) 'gold' is given by this type of real-world confrontation with gold, how can there be an account of what it is that 'gold' signifies if there is no corresponding kind in reality? If the term is senseless in this case, no account of what it is that it signifies will be possible. But if so it might seem that such accounts must be existentially committing.

The problem is acute for Aristotle. On the one hand, for the reasons given above, the account of what a name signifies should not be existentially committing. Further, he insists that terms which signify non-existents have significance (eg Post An. 92 b5-8, 28-9, de Interpret 16a16-17).[29] On the other hand, his account of the meaning of names sketched in the previous section covers only cases where the object or kind exists. Further, in certain cases, he takes what is signified by a name also to be something that exists. Thus, he writes (Post. An. 93b31-2):

> "e.g. what is it that 'triangle' signifies. When we find that it exists,..." [30]

If the 'that' (hoper) is taken strictly, then what 'triangle' signifies also exists. And this is what one would expect in the light of the referential account of meaning given in de Interpretatione.

What Aristotle requires is an account of

't' means o

in which (i) if o exists, 't' signifies o, and

(ii) if o does not exist, 't' retains its significance.

The first element favours the presence of a referential component in the account of meaning, the latter appears inconsistent with it. However, Aristotle's account of the meaning of 'void' suggests that he had the beginning of a route through this problem. He writes (Physics 214a16-17)

> "it is necessary that the void is a space, if there is one, deprived of bodies".

in answer to the question of what it is that 'void' signifies (213b30-31). His conclusion in 214a16-17 is not existentially committing. It suggests an account like this:

'if there were to be a place deprived of bodies, 'the void' would mean this'.

This allows for the following more general meaning-schema;

'If the void (A) were to exist, 'the void' ('A') would mean this.'

If 'means' has a referential component (as it must have for Aristotle, if he is to fulfil (i)) this could be partially represented as:

'if A were to exist, 'A' would refer to it'.

And this account is possible whether or not A exists. If A does exist, 'A' refers to it. If A does not exist, 'A' would have referred to it, if it had existed. Aristotle requires - and his remarks point towards - a conditional reference account of part of the meaning of names. For this allows him to meet both requirements (i) and (ii) above in a unified way.

If A exists, the account of what A is will invoke necessary features of A. Thus, in the case of 'thunder', it would involve (eg): a certain type of noise belonging to the clouds (93b36-37). Thus, one could replace:

'if thunder were to exist, 'thunder' would refer to it'

by the terms specified in the account, and obtain

'if a certain type of noise in the clouds were to exist, 'thunder' would refer to it'

If A does not exist (eg. in the case of the goatstag), the unity of the account will depend on us and not on the natural unity of the object. Thus, if one replaced:

'if the goatstag were to exist, 'goatstag' would refer to it'

by the terms in its account:

'if there were to be an animal which was part-goat and part-stag, 'goatstag' would refer to it,'

the unity of the replacing phrase, would like that of the Iliad, be the result of man-made 'stitching' only (93b35-36). Thus, the two types of account mentioned in 93b35-37 exemplify the two types of account of what 'A' signifies required for Aristotle's purposes. In this way, this sentence (b35-37) shows how he can maintain a unified account of 'means' whether or not A's exist, while giving distinct accounts of what A's are in the two cases. For (as argued above) the use of these different types of account does not entail that the meaning differs in the two cases. And this is because these accounts are relevant not to the meaning of the term, but rather to how the question of existence and extension are to be settled. Thus, in the case of non-existents, 'goatstag' would refer to goatstag, if it existed, provided that we could in that case settle questions of existence and extension using this account and our favoured methods of enquiry.[31] For the application of these methods is what would bring us into appropriate contact

with goatstags, if they existed. But if the meaning of 'goatstag' is fixed just by actual or counterfactual contact of the favoured type with goatstags, the account of what goatstags are (although useful in the hypothetical search as to their existence) will not be part of sense of 'goatstag'. In this way, Aristotle's account of the meaning of names and of what names signify can remain both existentially non-committal and semantically shallow.

7. Aristotelian Essentialism and Modern Essentialism.

For the modern essentialist, it is possible to render coherent essentialist claims without taking anything other than fundamental explanatory properties to be part of the fabric of reality. The rest is left up to the semantically deep, and existentially committed, referential intentions of the pre-scientific thinker. Indeed, given the depth he detects in these referential intentions, he is able to give a shallower, and less committed, theory of essence than is open to Aristotle. For if it is correct to attribute the account suggested above of the meaning of natural kind terms to Aristotle, the task of explaining the coherence of essentialist claims lay elsewhere for him than in the theory of reference. He required a deeper account of necessity and explanation than the modern theorist provides in order to fulfil an explanatory task left virtually untouched by his account of the meaning of these terms. All but the whole relevant explanatory burden falls in his thesis on to the account of explanation and scientific understanding, and not on to his theory of language. The ancient and modern routes to essentialism seem fundamentally different. And this is why Aristotle did not require to attribute to the pre-scientific thinker the deep assumptions invoked by the modern theorist.

There remains the issue of why, within a shallow account of the meaning of these terms, the expert (in large measure) explains the same phenomenon as those which the pre-scientific thinker grasps. Aristotle's assumption (as argued above) is that real kinds in the world fix the content of our perceptions and hence the sense of our terms, and that it is these self-same kinds which the scientist investigates. The world forces upon us the very conceptual distinctions which are required for its proper understanding and for our success as practical reasoners. And this does not require us to build into our concepts any reference at all to the internal workings of the kinds thus distinguished.[32]

## Footnotes

[1] Post. An. 93a22-24. My concern in this paper is with terms which signify types of objects with essences which can be discovered by science. It is left open here whether all such types, or only a subset of them, constitute natural kinds.

[2] See, for example, Putnam's papers: Is Semantics Possible? and The Meaning of 'Meaning' in Mind, Language and Reality: Philosophical Papers vol. II. C.U.P. 1975; also Kripke's Naming and Necessity in (ed.) Davidson and Harman, Semantics of Natural Language.

[3] There has been some fluctuation in Putnam's views over the years as to what precisely is grasped at the pre-scientific stage. Sometimes, he presents the following claim:

(a) For any possible world $w$, and every individual x in $_w$, x is water iff x is a sample of the same liquid as this in the actual world;

(eg. Meaning of 'Meaning' pp. 231).
but elsewhere he depends on the stronger claim:

(b) For any possible world w, and every individual x in w, x is water iff x is a sample of the liquid with the same basic physical properties as this in the actual world.

(eg. Meaning of 'Meaning' p. 232. In Collected Papers Vol. III, p. 63 'same basic physical properties' is replaced by 'similar in composition'). Salmon, (Reference and Essence. Princeton 1982 pp. 183 ff) notes that one cannot derive essentialist conclusions from (a) alone, without the addition of a further essentialist premiss:

(c) Every liquid substance is such that it could not have any physical constitution other than the one it actually has.

I will define a modern essentialist as one who accepts (b) because he wishes to explain the coherence of essentialist claims on the basis of the referential intentions of the pre-scientific thinker. See Putnam, Vol. III pp. 64-66.

[4] If one does not use the semantic depth of 'water' to achieve this goal, it is unclear what theoretical purpose is served by building it into the sense of 'water'. Why not favour option (a) of footnote 3, or a simple referential account of the sense of 'water', while explaining the speaker's readiness to defer independently of the meaning of the term? See the final sections of this paper.

[5] This issue is raised by Graeme Forbes in The Metaphysics of Modality (O.U.P. 1985 pp. 191-201.) One might also question whether the pre-scientific thinker distinguishes claims (a) and (b) in footnote 3.

[6] This account is one part of the de re sense theory: if there is no res, there is no sense of the appropriate kind.

[7] The first sentence of this chapter contains many exegetical puzzles. I will mention two:

(a) is a 'logos tou ti semainei to onoma...' one which gives an account of the meaning of (e.g.) 'Cicero' or 'gold', or is it one which gives an account of what it is that these terms mean: eg. the object Cicero, or the kind gold. The latter could call on scientific information not necessarily available to the pre-scientific thinker who merely grasps the meaning of 'gold'. I return to this puzzle below. (Section 6)

(b) I take the sentence to exemplify the following pattern of the argument:

P (1) $(\forall x)$ (x is a definition of F $\longleftrightarrow$ x is an account of what F is).

That is said.

P (2) $(\forall x)$ (x is an account of some type of what F is $\longleftrightarrow$ x is an account of what it is that (eg) the name 'F' signifies).

So,

(3) $(\forall x)$ (x is a definition of some type of F $\longleftrightarrow$ x is an account of what it is that (eg) the name 'F' signifies). That's obvious.

In this argument, (3) is obvious, given (1), because it is obvious that an account of what it is that a name signifies is an example of an account of what something is. This interpretation depends on the following assumption:

> There is a possible use of definition/account of what F is which is not confined to one which invokes essences.

This assumption seems plausible on two grounds.

(i) Earlier, in 92b26-28, Aristotle envisages (in aporetic discussion) a type of account which does not give the essence of F, but which rather signifies the same thing as the name. Since this type of account is contrasted in both passages with essence - invoking ones (92b28-30; 94a1-2), it cannot itself be essence-invoking. Further, since this type of account is not existence-involving in 92b28-30, it should not be in 93a29-32 either. If so, in B 10, Aristotle resolves this particular aporia from B7 (92b26-30) by separating two types of account:

(a) an account of what it is to be F, which is not essence or existence involving;

(b) an account of what it is to be F, which is essence and existence invoking.

It is the first type of account which is the principal focus of 93b29-94a2, while the second is introduced in 94a2-7. The first type of account but not the second can be given of terms which signify non-existents: eg. 'goatstag'.

(ii) In Metaphysics 1030a14-31 and b12-13, Aristotle envisages accounts and definitions which do not invoke essences (eg. of white man). If so, there can be a type of definition which says what it is that a name or name-like expression signifies (1030a15-18) but which does not invoke essence. This should be contrasted with accounts of what-it-is-to-be-an-F

(1030a29-b10) which do involve essences. In this section of Metaphysics, Aristotle appears undecided as to whether he should ultimately accept as genuine all these types of definition (1030a17-18). But if the former type of definition can even plausibly be described as a definition, this is sufficient to allow it to be included as such in Posterior Analytics 93b29-32. For the relevant clause itself is introduced with the non-committal phrase: 'it is said that. (b29).'

[8] As Robert Bolton claims in Essentialism and Sematic Theory in Aristotle, P.R. 1976 pp. 523ff.

[9] As Terry Irwin argues in Aristotle's Concept of Signification pp. 246-248 in Language and Logos (ed) Schofield and Nussbaum. C.U.P. 1982.

[10] 71a12-16. The verb is prolambanein: to take in advance. If in this passage 'triangle' is not used to refer to a starting point of science, Aristotle must be construing lambanein as assume, and not as assume without need for proof (as Robert Bolton suggests in his paper: Aristotle on the Signification of Names. Language and Reality in Greek Philosophy. Proceedings of the Greek Philosophical Society 1984/85); for in such a case proof is possible and required. Since the same term also is used of our grasp of 'monad', this must also mean assume and not assume without need for proof.

[11] For parallel passages, see also 76a31-6, 93b25-26. In the latter, Aristotle distinguishes the mathematician's hypothesis that the monad is A$^{n}$C, from the hypothesis that it exists. Richard Sorabji called attention to some of these passages in Necessity, Cause and Blame, Ithaca 1980 pp. 196-7, in arguing that, for Aristotle, 'definition does not imply the existence of instance.' However, Sorabji also holds (op. cit. p. 198) that accounts of what names signify can only be definitions if the object or kind named exists (in B 8-10). But if Aristotle had made this latter claim, it would have been difficult to motivate without the assumption that definitions do imply the existence of instances (as Bolton notes. op. cit. fn. 10). My suggestion is that there can be (at least soi-disant) definitions of what names signify which do not imply the existence of the kind. See footnote 3 above.

[12] Other cases are: the moon is eclipsed (90a13), the existence of eclipses (90a27).

[13] Another example is provided by Aristotle's discussion of 'quadrature' (tetragōnismos: de Anima 413a17-21). Its first stage 'definition' construes it as the construction of an equilateral rectangle. Since the proof of its existence will involve the actual construction of such a triangle, this is separable from and occurs subsequent to the postulation of the initial 'definition'. If so, since at the initial stage, it is uncertain whether such a constructive proof is possible, its existence should not be assumed in the first 'definition'. I am indebted for discussion of this point to Wolfgang Detel (University of Hamburg).

[14] See, for example, 93a30-36. Also 90a5-8.

[15] I intend in this paper to remain neutral as to whether the inquiry which Aristotle envisages is one which is constituted by chronological stages (as in an actual search) or by logical stages (as in a rational reconstruction of a search). This important issue lies outside the scope of the present paper.

[16] In contrast with the cases discussed in B 9 where there is no such middle term.

[17] I take these cases to exemplify instances where 'one has something of the matter' for the reasons deployed by John Ackrill: Aristotle's Theory of Definition: Some Questions on Posterior Analytics II.8-10. Aristotle on Science: The Posterior Analytics (ed) E. Berti 1981.

[18] I take 'having something of the what it is' (a 29) to parallel 'having something of the matter' (a21-2). Since the former is prior to the discovery of existence (a32-34), the latter (a21-2) must give only a necessary condition for knowing non-incidentally that thunder exists.

[19] It will be objected that in 93a30-2, the investigator already knows what the middle term is (viz screening by the earth), and that this is why he knows that the question of whether the moon is eclipsed is the same as whether it is screened by the earth. If so, it will be said, this argues for the inclusion of this middle term in the initial account of 'eclipse' as a certain type of deprivation of light. This argument seems inconclusive: even if we accept (which we are not forced to) that the enquirer in 93a31-32 already knows the identity of the positive middle prior to the discovery of the existence of thunder, this could simply be because he was adept at postulating relevant middle terms without these being part of the meaning of the terms. Such an enquirer would exemplify acumen (89b10-20). If acumen is to be a particular skill, and not the common inheritance of all, middle terms cannot generally be parts of the accounts of what eclipses are. If they were, we would all grasp immediately what the middle term is when we grasped the (conclusion-style) account of what eclipses are. For a contrasting view, see Robert Bolton's important forthcoming paper: Definition and Scientific Method in Aristotle's Posterior Analytics and Generation of Animals. Philosophical Issues in Aristotle's Biology: ed. Gotthelf and Lennox.

[20] Aristotle makes this point at (somewhat tedious) length in the following passages: 91b8-12, 93a12-15. Also 91a31-2, 36-37.

[21] Accounts of what names signify should (in certain cases) be capable of playing this role if they give information which is necessary for knowing non-incidentally that the thing exists (eg that thunder is a certain type of noise in the clouds) and this is established (where there is a middle term) by finding a middle term which shows that noise of a certain type does indeed belong to the clouds. This does not mean that all accounts of what

names signify play this role; the account of 'goatstag' and of 'monad' will not (for distinct reasons). Further, the conclusion of a syllogism may be different in form from the original account (eg. lacking the indefinite 'a certain': 94a7-9, see 93b9-12), even if they express the same proposition. The original account might be:

thunder is a certain type of noise in the clouds,

while the conclusion would be

thunder is the noise in the clouds (i.e. the one which is caused in way F).

The fact stated by the latter proposition would be what makes the original account true.

22 If there is ground for deference to experts in Aristotle's account, it is to be found at this stage of investigation into existence and not at the earlier stage of grasp of meaning. The expert is better at the explanatory task required if one is to establish the existence of F's (viz finding the relevant middle term). But this does not require that the ordinary thinker, even at this latter stage, has views about the possession by F of essential properties (whatever they may be). It demands only that he can see the expert as engaged in an explanatory project which is a recognizable extension of his own and which relies on methods comparable to his. (See Aristotle's examples in 96a25-b10, 97b7-31).

23 I use 'object' to stand for what Brentano calls the intentional object of perception. Brentano, Die Psychologie des Aristoteles. Mainz 1867.

24 The scale of the difference between Aristotle's account of meaning and that common in post-Fregean tradition explains part of Terry Irwin's motivation for denying that Aristotle was presenting a theory of meaning at all. For Aristotle is not concerned with giving linguistic synonyms which will be recognized as such by all competent speakers (op. cit. p. 243) nor with showing how an individual's competence with a term fixes its extension (op. cit. p. 243 fn 3). Indeed, he differs au fond from the Fregean legacy, of which the conceptual analysis favoured by Irwin is only one part. However, Aristotle's schema

'A' sēmainei A ,

is in one perfectly good sense a theory of meaning: it explains under what conditions 'A' is correctly applied, and under what conditions it is not. If a theory of meaning is what states conditions for correct application of terms, Aristotle gives such a theory. (See M. Morris' unpublished paper: Aristotle on Meaning)

25 See, for example, 214a14 with its back reference to 'certain thinkers' (211b7, 29-212a2). Plato may be included also (209b11-16).

26 Aristotle occasionally refers to the latter part of the formula as the relevant account (eg. 93a20-24, b35-37); but the former is needed if the formula is to give the meaning of 'thunder' (94a2). Aristotle discusses the problem of getting terms like 'thunder' in proper shape to ask the 'why?' question in Metaphysics 1041 a24-26. He recommends replacing them by complexes such as: 'noise in the clouds' to get the right results. This process, which is essential for successful investigation into both essence and existence (see also 1041b1-3), requires the formulation of an appropriate account of the type suggested here.

27 One can of course know that thunder exists (viz that a given noise belongs to the clouds) without being able to demonstrate this via a middle term which states the essence. All that is required for the first stage is grasp on some causal factor which is sufficient to distinguish thunder from the sound-alikes one actually encounters. Thus one may know that 'noise belongs to the clouds' is true, without knowing that it is demonstrably true

(93a36-b14). This account neither requires different 'senses' of knowledge at the two stages nor different propositions known. Contrast the account suggested by John Ackrill, op. cit. pp. 365-370.

[28] The initial grasp of the meaning of a term should be separated from what is required to know of two terms that they are synonyms (eg Topics 162b25-163a1 ; Categories 1a6-8 etc.) For the latter may require knowing:

(i) that the two terms signify the same object/kind;

and

(ii) that the account of what it is that the terms signify are the same.

This account of synonymy clearly rests on an account of signification in both clauses. If the argument given so far is correct, it is not necessary for the person who understands 't' to know (ii). Thus, Aristotle allows (contrary to Frege's principle, cited by Wiggins: Frege's Problem of the Morning Star. Essays on Frege (ed) Schirn vol. III) that one may know the meaning of 't' and of 's', and these terms be synonyms, but one not know that they are. It should be noted that the shallow account of what it is that terms signify (given above) blocks the inference (which is anyway dubious) from the claim that name and definition signify the same thing to the conclusion that names signify essences. It is a merit of the Analytics account that it clarifies the type of account relevant for what terms signify, so as to block this inference. For a contrasting view, see Irwin, op. cit. p. 246. Terry Irwin's argument is ably criticized by Pantazis Tselemanis and Robert Bolton in their contributions to Language and Reality in Greek Philosophy: Proceedings of the Greek Philosophy Society 1985/85.

[29] These examples are not considered by Michael Wedin (Phronesis 1978) or William Jacobs (Phronesis 1979) who defend the view that grasp of names is existentially committing in Aristotle's theory.

[30] Or alternatively,

"When we find that what it is that 'triangle' signifies exists..."

[31] Aristotle notes a rich variety of cases which require separate treatment in considering empty terms. One set is of cases introduced by explicit identification with a description (cf. de Int 18a18-26 ; Meta 1045a26-28); a second consists of cases like 'Homer' which are to be analyzed as complexes (viz 'Homer, the poet': cf. de Int 20b24-32); a third is of apparently simple names for non-existents (eg 'Sokrates': Categories 13b15-19, 25-27). The account I offer here will apply to all these cases, but is principally aimed aimed at the (most difficult) third case. I aim to discuss these issues in more detail elsewhere.

[32] I am heavily indebted to Gavin Lawrence and Michael Morris for many discussions of these topics. The present paper is one part of a joint project on Meaning, Natural Kinds and Necessity in Aristotle on which we are currently engaged. Parts of this paper are based on profitable and detailed discussion of Posterior Analytics B.7-10 over three years at the Oriel Ancient Philosophy Discussion Group, whose other members were Kei Chiba, Paula Gottlieb, Tomomosa Imai, Penny Mackie, Dory Scaltsas, Pantazis Tselemanis, Jennifer Whiting and Michael Woods. I have gained greatly from the papers on these topics by John Ackrill and Robert Bolton, and from extensive and constructive discussion of these issues with Robert Bolton in a joint seminar at Rutgers University in autumn 1985. I fear that none of those mentioned agrees with all of this paper, and that some of them agree with none of it.